

EXHIBIT B

Alexei Ermakov

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PROFESSIONAL EXPERIENCE:

2004 -- present	Director, Chemistry Instruments & Experiments, Rutgers University.
2000 -- 2004	Assistant Research Professor, Rutgers University.
1996 -- 2000	Research Associate, Rutgers University.
1992 -- 1996	Post Doctoral Fellow, Rutgers State University of New Jersey.
1987 -- 1992	Researcher, Institute of Physics, St. Petersburg State University, Russia.
1984 -- 1987	Researcher, Institute of Petroleum Chemistry, St. Petersburg, Russia.

EDUCATION:

1987 -- 92	Ph.D. in physics, St. Petersburg State University, Russia Thesis title: Study of the formation mechanisms of nanostructures on the surfaces of solids by means of Scanning Tunneling and Atomic Force Microscopy
1978 -- 84	MS in Physics, Leningrad State University, USSR.

RESEARCH AREAS:

Development of new techniques and instrumentation for research in Surface Science, Chemistry, and Nanotechnology.

HONORS AND AWARDS:

2011	R&D 100 award for development novel autoresonant electrostatic ion trap mass spectrometer
1996	The International Society for Optical Engineering selected the paper "A novel AFM/SEM system" for a reprint collection of outstanding papers from the world literature on science, engineering and technology: SPIE Milestone Series MS 129.
1989	The Leningrad State University, Russia, (now St. Petersburg State University), awarded prize for achievements in design and creation of the Scanning Tunneling Microscope

RESEARCH EXPERIENCE:

2001-2022

Invented and obtained several patents for a new type of mass spectrometers – electrostatic ion trap autoresonant mass spectrometers. The most significant features of this innovative mass spectrometer are its unlimited mass range, exceptional ease of construction, robustness and light weight. This technology has been licensed by Brooks Automation. The division of Brooks has recently been acquired by MKS Instruments. The autoresonant mass spectrometer is now commercially available. The 830 Vacuum Quality Monitor technology has been given the accolade of a R&D 100 award.

Invented and patented a new technique for surface work function measurements using a constant deflected grazing electron beam. This technique was used to achieve concurrent measurements of helium atom reflectivity and work function changes taking place during molecular oxygen exposure of a Cu001 surface.

1994-2001

Conducted studies of adsorption of PF_3 on Cu(001) using helium atom scattering. This research investigated ordered overlayer structures and frustrated translational modes of adsorbed molecules on a metal surface.

Developed a new scanning tunneling / atomic force microscopy technique. The technique was employed to image leakage current distribution in thin oxides, and to study dielectric breakdown of diamond films on silicon.

Invented and build a novel contactless surface conductance measurement instrument. This instrument is being used in ultra high vacuum experiments to monitor the change in surface conductance on semiconductors during chemical vapor deposition of metals.

1993-1994

Created a novel AFM/STM/SEM system for topographic and electrical measurements. The system merges two instruments - an Atomic Force Microscope (AFM) and a Scanning Electron Microscope (SEM), and introduces an electron beam method for detection of the AFM cantilever deflection.

1992-1993

Developed a technique for the study of electron induced decomposition of allylcyclopentadienyl palladium [$\text{Pd}(n^3\text{-C}_3\text{H}_5)(n^5\text{-C}_5\text{H}_5)$] and the subsequent deposition of Pd on a Si (111) surface. This technique employs the ability of a Scanning Tunneling Microscope to produce a nanometer-scale electron beam. Mechanisms for Pd nanostructure formation on silicon surface were studied.

1987-1992

Designed and built a Scanning Tunneling Microscope (STM) with an extremely large scanning range. Created software for the control of the STM, data acquisition and processing.

Conducted research in the formation mechanisms of surface supported nanostructures. This research demonstrated the feasibility of writing and storage of information on an ultra high density nanoscale.

1984-1987

Experimental study and theoretical modeling of hydrogen diffusion in metals. Developed a novel "concentration waves" method for examining the diffusion and capture of hydrogen in defective media. The method used Fourier Transform analysis of the hydrogen flux through the metallic media.

TOP 10 MAJOR PUBLICATIONS:

A novel afm/stm/sem system, AV Ermakov, EL Garfunkel, Review of scientific instruments 65 (9), 2853-2854,1994

Cu (001) to HD energy transfer and translational to rotational energy conversion on surface scattering, LV Goncharova, J Braun, AV Ermakov, GG Bishop, DM Smilgies, The Journal of Chemical Physics 115 (16), 7713-7724,2001

Phosphine adsorption and the production of phosphide phases on Cu (001), LV Goncharova, SK Clowes, RR Fogg, AV Ermakov, BJ Hinch, Surface science 515 (2), 553-566,2002

Electron beam induced patterned deposition of allylcyclopentadienyl palladium using scanning tunneling microscopy,DS Saulys, A Ermakov, EL Garfunkel, PA Dowben Journal of applied physics 76 (11), 7639-7641,1994

An electrostatic autoresonant ion trap mass spectrometer
AV Ermakov, BJ Hinch, Review of Scientific instruments 81 (1), 013107,2010

Three coil apparatus for inductive measurements of conductance
A Ermakov, BJ Hinch, US Patent 6,448,795,2002

Application of a novel contactless conductivity sensor in chemical vapor deposition of aluminum films, AV Ermakov, BJ Hinch, Review of scientific instruments 68 (3), 1571-1574,1997

Surface intercalation of graphite by lanthanum, GV Prudnikova, AG Vjatin, AV Ermakov, AM Shikin, VK Adamchuk, Journal of electron spectroscopy and related phenomena 68, 427-430,1994

Adsorption of PF₃ on Cu (001): Ordered overlayer structures and frustrated translational modes
J Braun, GG Bishop, AV Ermakov, LV Goncharova, BJ Hinch
Journal of Chemical Physics 110 (11), 5337-5345,1999

Thermal chemistry of CH₃ on Si/Cu (100); the role of Sn as a promoter
XV Zhang, DR Strongin, LV Goncharova, AV Ermakov, BJ Hinch
The Journal of Physical Chemistry B 108 (41), 16213-16219,2004